Notebook Series -- Notebooks by Edison and Other Experimenters
Disc Record Book No. 4
Notebook, N-16-01-28

This notebook was used by Edison in January-February 1916 for notes on experiments to improve the composition of disc record blanks and the varnish surfaces applied during the transfer process. Included are notes describing experiments numbered from 139E to 185E in which the ingredients for record blanks and record varnishes are varied. Also included is a small group of experiments on varnish compounds, along with several lists (called "testers' designations") of flaws observed in record blanks. Additional entries summarize the results of the numbered experiments, as well as relevant information from earlier notebooks. The front cover is labeled "1916 #4." The pages are unnumbered. Approximately 140 pages have been used.

1 — 28 — 16

13 E

10 CP phenol free resin by NaOH,
1/2 of 6/4 1% paraphenylenediamine
16 alcohol

10 CP Resin grams
16 " Alcohol
100 Milg Para
50 milg 6/4

10 CP
3/4. 6/4 1 para

10 CP
1 6/4 1 para

Do on

10 CP
1 1/2 6/4 1 para

See over

10 CP
1 3/4 6/4 1 para

10 CP
2 6/4 — 1 para

10 CP
2 1/2 6/4 1 para

1 —	2 3/4	6/4
2	3	6/4
3	3 1/4	6/4
4	3 1/2	6/4
5	3 3/4	6/4
6	4	6/4
7	5	6/4

8 = Read regular
4 days in Yee
Chest

1—31—16

Results 139
Schedule in Water Jacket OVEN
1 hour to 100°

1/2 "	115	No 1	not condensed
1/2 "	125	2	" "
1 "	145	3	" " bubbled some
1 "	150	4	1st stage rubbery when hot Brittle friable when cold
1 "	155	5	About same as 4
1 "	160		
1 "	170	6	3/4 Condensed
1 "	180	7	1st Stage rubbery fully finished
1 "	190		
1 "	200		

Shut off - cool down all night

The whole run is wrong very little Ventilation and the temp is too low, should go 2 25° at least & held for 2 hours

It may be the CP Resin needs higher temp —

I heated them on hot plate - 2 1/2 6/4 is Condensed + hard leaves plate but others not good - Think 2 1/2 is Minimum + should have 2 3/4 3 3/4 3 1/2 3 3/4 4 series run final or 212 & hardened on plate

Note - Resin 16/1 fear phenol in ~~NaOH~~ in NaOH, boiled down thick using 6/4 Condensed OK, fine Varnish - 9/1 well Condensed think NaOH can be washed out & still leave a good surface. Should be flexible needs rough Experiment & have it Condensed OK & hard —

Continued - Or put in an oven oven & go to 235 for 2 hours

Cant Scratch No 6 or 7 by finger Nail at all

5 Either —

135 = Doing now

Flow 12 plates with Regular Varnish and 12 plates with 116E. Varnish — Rub the plates with Oil of Sesame ~~&~~ so Veneer will leave the plate free — Want to see which Varnish Contracts the most —

Woodwork

136F Hun

Press 2 Regular blanks &
2 blanks made of 1293
powder ground to 68%
between two polished plates
at 1000 pressure in
Printing press —

Edge them all on same
Mandril to get all same
size — Bring down to
Chemical room want to
~~test~~ Expansion at
deffarent temperature

Test before baking		2nd test after baking	
RO	fine	RO	fine
1		1	
2	good	2	good
3		3	
4	fair	4	fair
5		5	
6		6	
none	Ruff	none	Ruff

No 2 — 1 [illegible]
3 " [illegible]

Annealing —

1 has warped 1/32 more
Moore says —
others OK Music OK —

Think annealing OK

137E

9

Bake 6 Reg records between clean varnish plates in Chemical room up to 130 Fahr or softening point + then Cool —

Test surfaces before doing so + after baking

8 am	70	7 pm	80
9 "	80	8 "	70
10 "	90		
11 "	100		
12 "	110		
1 pm	120		
2 "	130 —		
3 "	120		
4 "	110		
5 "	100		
6 "	90		

These are actual baking temps —

Moore 138E 9

Get me 1 oz of the 1293 powder received there 180 mesh count the powder that passes 180 — test for fire if it ignites easy bring to Chemical room for test.

Edison 139 E

Take 22 grams pure Phenol and 6.32 grams 6/4 ~~or~~ Reflex tube + Condense it —

It condenses it to a resin with smell of free phenol — + thats about all — ~~compressing~~ amount of Water Comes on top of resin — 1/2 + 1/2 I added a little alcohol to dissolve 6/4 but it wouldnt so added Enough water to just dissolve 6/4 hot,

Formation of resin forms water I guess

RO \	Fair ~~IIII~~ II
1 - 1	
2 \	good III
3 \	
4 \	fair I
5 III	
6 III	
none \	Ruf I

Old powder co NG
Blank too hard Could not use
it anyway —
Transfer 12 110 ok 1 thin margin
black on edge work
Print 6 5 ok one cracked
feed line, play squeeze and
very hard blank

So hard moulds load
give good impression

140 E

9

5 Wood 2 old powder
1½ Lac 63% Iron 180
— mesh — make 24
blanks Req size —

use 116 E. Varnish
plates
Transfer 12
print 6

1st ring in moulding 1/8 scrape off
lot 394 — Calipers 235 —
lemon moulds frosted and cloudy
25 all ok

RO — fine ~~IIII~~ II

1

2 I — good ~~IIII~~

3

4 III — fair

5 ~~IIII~~ I

6 II

none — Ruf

116 E Var — 390 plates

Without Negrosine

Bubbles	32	45 OK
Raised	3	249 fine bubbles
Chipped	6	13 patch -
Wrinkles	16	
Dimples	8	
	65	325

83.3%

Negrosine may be bad

141 E

Make 2 gallon 116 E but put in the Negrosine

Transfer 12 on 1293 powder ground 63% Item 180 -

Print 6

Transfer 12 110 OK 1 Bad

Prints 6 60 OK

Stuck to plate 1 side, edge	4
Both sides	6
Released freely	2

Flow — Thin lot wrinkles bad plate poor - Varnish separates Image center of plate 67% break away

132 plates

OVEN - Raises 22

Wrinkles ~~22~~

Chipped 7

Dent 1

Uneven 3

Bubbles 4

39

70%

Cancelled

36 OK

18 uneven

39 patch -

93

142 E

Okworlesk 9

Moore get me pint of
Regular dip Varnish
+ 1 oz. Lampblack
Edison to load dip
Varnish up with Lampblack
as far as it is practical

" Moore has a single film
blank with 3 sections daubed
on 1 face. Some Lampblk Marked
1 then 2 has more + 3 much
only No 1 is practical —

143 E

Moore

9

Note your present records are generally flat, if you can find some dished ones bring them to Chemical Lab. —

144 E

Now 1—31—16

Put in 6/7—15. 7 months

7 to 1 old Lacblank Blank

not dipped 3 of them

Put in Window of old

dipping house (Hot House)

Exposed to sun on one

side — other side got no

sun — Weather got on

" 2 Cracked on shady side —

none on other or sunny

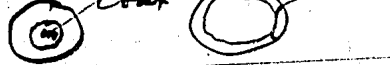
side — They are pretty flat

slightly bulged on sunny

side — but to hardly enough

to notice — Cutting edges

with Knife gives no cracks



The 2 Ckd

145 = 2" plaster paris-
blank $\frac{1}{4}$" thick dried out
then soaked in Dip
Varnish thinned down
Equal bulk alcohol
soaked -

Weight before soaking
15.350 grms
after 17.220. dried -
1.870 gain 12.1% Lac
Reg blank has 28% Lac
(1793)

dice went all thru but
not enough of it

pressed it in press hot
brake about same as
Reg plaster paris wood

RO	Fine IIII	test for
1 - III		Varnish
2 I	Good IIII	
3 I		
4 III	fair I	Transfer
5 III		
6 I		
Non	Ruf - II	Varnish seems ok to the D-d blank

12 Transfer 12 ok
6 print 6 ok

Oven — 65 plates 2 large bubbles
1 Dent 1 Dimple — 4 discards
59 good plates

55 - Even plates — 1 patched 3 fine bubbles

Flow Extremely bad worry Var
washes good — Even dont Crap s.
after plate adds heavy gray scum
shows up on surface 10%
patch plates

Weld seems perfect Can
underrun Knife at all —
Test we have

Q see Chl Amin Crystal on surface of print of smooth plates Thus kills it most cases HCP - powder & mend get bonded of 17 is better

146E

Will transfer on 1293 of 117 or ~~[illegible]~~

117 Blank

Hydrochloride of 6/4

Make about 1 gallon of Regular Var but instead of using 8 6/4 Use 10 grams Hydrochloride of 6/4 — ~~Use Neg~~

Dont use Negroin

Inspect for defects & Bubbles — use 5% Extra Water in place alcohol to get the Hydrochloride to dissolve

1-31-16

Note — Noco on hand

Bag 4	48E	Reg	68	Burn 180	
½	48	fine ground	89 c/o	Burn 180	✓
4	1293	Reg ground	34 c/o	"	"
1	1293	fine "	63	"	fair
1½	1297	fine (now reg)	48	"	"
1½	1397	" "	89	"	✓
1½	1398	" "	65	"	

1 Bag makes 50 to 60 blanks

	plates 1680 of 147	1662 plates
	over 14	NO1 over
Uneven	2	2
Bubbles large	288	292
Raise	109	138
Cracked	3	5
Chipped	7	7
Dent	2	3
injured	9	0
Dimples	11	12
Wrinkled	28	23
	459	482

Raise & bubbles is trouble

Very creeps breaks in center already
got nasty dirty color
50% to catch —

This is not the same resin as in previous 116E but a new Resin having 16% phenol only 15 sec difference in viscosity.
Think 6/4 too low & Resin has more than 16% in Resin.

147E

Trial

Transfd 24
13 OK 4 pull outs
4 Birds —

Run through 50 gals
E 116. – Req Schedules
Have them inspected
plates transfers & Prints
Negrocine Para & Sandrite

All transfd on old 1293 – 48% Ilum 180

Transfd 24 – 10 OK
1101 over 10 pull outs 4 Birds

1014 over Transfd 24 9 OK
8 pull outs 5 Birds 2
Cracked varnish —

Regular 24 24 OK –
for Comparison

I put 50 grams of Crystalized Phenol 14.5 grms 6/4
had to put some alcohol in diluted with water to dissolve the 6/4
use flask & reflex tube, all night on hot plate, gives a brittle resin, rather low melting point —

This proves that our Reg Veneers is Composed of 29% of at least of Brittle resin — as nothing (ie) 6/4 was left to Condense the 71% of Resin — the chances are that our pregnant Veneer where phenol is brought up to 22 free phenol — That we have a very much softer resin in our Veneers (ie) 30% of worse than usaless semi resin very brittle —

1—28—16

Notes

Plates good	41261
Transfers "	20327
Blanks sent up stairs	21262

93% OK plates
75.5 good transfers
4.1 " Correct
23.4 Rejected

Printed-Rag	13326
Repaired & Dipped	1506
	15875
Test Dept Received	15782
OK	6730
Discarded	6056

Knocks 9%		1165 *
Crackles	26	
Run Outs 13.8%		1769
Ruff surface .5	85	
Cracked 6%		767
Poor print 1.6	207	
Scratched 2.9		374
Silver Spots 2.4		314
White Spots 3.8		482
Holes 1.6		212
Mld Knocks 2.9		378 *
Red line	26	
Bad Centers	87	
Cuts	18	
Chip'd Edge 2.8	117	
	6056	

Dipped + Repaired

Knocks	385
Run Outs	306
Cracked	66
Bad labels	81
Scratch	54
Silver Spots	39
White Spots	68
Holes	32
Mld Knocks	82
Blank Dent	30
Bad Center	13
Cuts	17
Chip'd Edge	16

Testers Designations

White Spots

1 - Bird filled with white Transfer polish
2 Bubble
3 Bubble
4 "
5 "
6 "
7 "
8 White in it probably bubble
9 "
10 Fine angle crack shows yellow
11 White chunk in - probably a bubble
12 white thin + transparent
transfer not cleaned well left some polish
on + not wiped off —

Testers Designation Knocks

1 Fibre - long not round - possibly foreign
2 Cracked after printing by hitting record
3 Another Mechanical injury
4 Torn spot undecided
5 Looks like dirt spot, possibly a Gubb-Pebble
6 Knot of very fine fibre
7 Moore say Vienna lime white spot
8 Small Gubble $\frac{10}{1000}$ dia
9 Bunch small fibres
10 Crack full of dirt might have been bird
11 Dirt on transfer

Testers	Designation		Holes
1	Bubble	Discard	
2	"	"	
3	"	"	
4	"	"	
5	"	"	
6	Reproducer	skipped	Discard
7	Bubble		"
8	"		
9	"	Closed up	"
10	"		"
11	"		"
12	"	big-	"

"

Jesters Designation
Silver Spots

These are due to lead gasket wire squeezing out & pieces lay on mould & pressed in Incoloy
Wants a harder alloy

1 –	Show – lead piece –	Do
2	Bubble	"
3	Piece of lead	"
4	"	"
5	"	"
6	"	"
7	"	"
8	"	"
9	"	"
10	"	"

Yesterday's Description

Scratches —

1 — Bruise — Disc
2 " "
3 OK — one record scraped over another
4 OK Only Top bruise —
5 OK " "
6 Scratch too deep Discard
7 " "
8 " "
9 " "
10 " } Moore
11 " } says girls pulling on machine
12 " }

Doubtful as caused by pulling on machine — Tried it & it caused great & premeditated pressure — Even then not so bad & unlike records tested

Its a musical chase short & sharp with great pressure

Testers Designation Cuts

1 OK only Top wall brushed over
2 OK " "
3 OK " "
4 OK Speaker skipped
5 OK Only wall hurt
6 OK " "
7 OK speaker skipped from one to other gram

All Cuts will generally be found OK — Have Special arrangement for these —

	Days Run
Knocks Scratches Silver Spots White Spots Holes Cuts	2802

		Loss
Knocks	41.5 %	$332.0
Scratched	13.3	$109
Silver Spots	11.2	$90
White Spots	17.2	$136
Holes	7.5	$60
Cuts	0.6	
		$726.

1-28-16

Testers of Transfers
show 17.7% loss for
plates <u>not</u> repaired
and
17.5% loss
on Repaired plates.

Out of 20138 Transfers

3917	discarded	for	Cracked Var
402	"	"	Chipped
16	"	"	Holes
21	"	"	Mechanical
2			Thin Margin

Cracked Var is 19.45% Discarded
of the whole lested 20138

Cracked + Chipped is the problem

There are radical marks from Edge to Center about 1/2 to 3/4 apart This is strange they are very straight

Only on 1 side

Veneer Very flexible -

This shows our veneer has lots of uncondensed or semi condensed Resin Sol in Alcohol or it would be so flexible after soaking several days in Alcohol

Putting 10 Carbolic + 6 grms 6/4 10 pellets with 100 mls Para Condensed at once to a Resin Sol in alcohol to this resin that dissolves out + makes a record flexible in alcohol

Soaked reg blank 5 days in alcohol +

Swells up + Opens on Edge twice the size -

Strange thing about it is that the whole Record is worms, mottled the Varnish Cuts like Celluloid -

The Veneer stripped off shows worms which are very big deep

There is probably so much free phenol in it segregated along these Channels that alcohol has dissolved it out + it has Collapsed

148 E

New resin 16% on this not Enough
6/4 ~~Each~~ hum if he could to
add 1/2% more 6/4

Make up Enough 116 E Varnish
to make 700 plates.
Bake 1/2 of the plates in
one oven 1/2 in another

Leave out The Negroins

Transfer 24 from
Each oven - Reg blanks

Use same screw as you used
on 147 -

Also 24 on 1293 blank

149 E

Fred OH = Seperate 25 lbs of Sandarac into the two parts = fusible & infusible ready for Varnish Exp mts.

Done

150.E

Bake some 1" plate · 3 on Screen
3 on Asbestos 1/32 thick - to see if
Can't stop bottom of plate getting
hot 1st & making bubbles
Could use paper on Reg transfers

151 E

Cut Cardboard out same size as Varnish plate put 100 under 100 plates + fill 10 ~~trays~~ Cages alternate ~~trays~~ Cages in oven with Cages without Cardboard
Want dry by the Top.
Also 2 or 3 Cages placing Varnish over another not having Varnish on

New plan.

For every Big batch Resin
Make up 1 gal + 5½ 6/4
no negramine — 1 gal 6 6/4 —
get report Oven plates + Transfers
This will give a line on
proper amount 6/4 to use on
this particular lot of Resin

Bake at 212 Var plates
before flowing only
for few seconds

152 E

Moors Run Schedule on Reg Varnish. Without Negrosine +

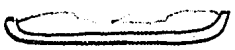
Start		100° Fahr
1 Hour	to	110
1 "		120
1 "		130
1 "		135
1 "		140
1 "		145
2 "		150
2 "		155
2 "		

Hoffman Give me some Negrosin -

I put 3 1" disc on glass under Bell jar with cup of strong H_2SO_4 15 hours — found Var No 7 see 1st page, ~~for~~ the Var was well dried & at thin putty consistency but had several small bubbles Whale has been at ordinary temperature, bubbles may have been in when I poured it & fail to leave, but I did not see them — yellow color to H_2SO_4

Its not certain they are bubbles ~~[illegible]~~ dust nuclei

Notice that in drying Halloran



Regular + the others do same

152 E

Exprmt CP Resin from Soda —

Dry 2 hours in air — Water jacket oven used

Then in water jacket oven

1	Hour To	100° Fahr
½	"	115
½	"	125
1½	"	135
1½	"	145
1½	"	150
1½	"	155
1½	"	160
1	"	170
½	"	180
½	"	190
½	"	200

Take out + put in plain oven

1	"	220
1	"	235

Cool off

See 1st page this book

Notes from the 5 old books

79—719— fine powder especially screened 100% good Transfer 91.6 Print. Says Banner. This is first I have seen in the 5 books Examined that is good

Nov 22 1913 says up to date best is Phenol resin 4 wood double ground 1 Resin 5% $\frac{6}{4}$ 50 passing 200 mesh Machine jar loading pressed 3 min Contact 4 min 1200 lbs — Scrapers flat with 2 Concave #26 scraper — Top plates put in by Machine — Blanks Baked 1/2 hour 180° Fahr Transfer Reg plates 45 cc 632 Var 15 minutes 500 lbs — Print 2 min heat 3 min Contact 5 1000 lbs

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1-26-16 Apparently Chloride of Ammonia — Paraphenylenediamine & Acetate of Magnesia & Sandarac Only slightly noticeable Materials so far used

Old books

Veneer stripped from Transfer & fibres dissolved off

Callipered Average 14.33 Good
" 12.78 Bad

Creosol Blanks -

Water May play an important place in Varnish Also surprisingly large amount of water can be used without apparently effecting the Varnish — On account of the great solubility of 6/4 in water some water would keep 6/4 from segregating in Var in Oven

Paraphenylendiam Hydrochloride is Sol Alcohol with little Water in + more so when Varnish in (18) Resin — + May be more active than 6/4

1% of Resin in Var permits 1% Ammonia Chloride to dissolve using no Penta or Paria —
1-26-16 — perhaps more water would permit more NH4Cl to dissolve

Old notes

All varnish plates containing NH_4Cl are surprisingly pock marked + look bad yet transfer good — on Crasol blanks gives 80 to 100% good

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Reg resin containing an alleged 16.6 free phenol - saponified (500 grms) by NaOH. precip by HCl + filtered Acid solution contain 5 or 6 grms of what appears to be Rosolic acid probably some Resorcin - Resins probably vary considerably

Alleged Rosolic in cold is solid but its viscous - tried to condense it with 6/4 but didn't do much

Sandrac gives Bad bubbles the part dissolved by Benzol is clear + glassy when warm pulls out in fine + finder webs, readily sol in Alcohol

The part not dissolved by Benzol is light + infusible right on hot plate Its sol in Alcohol but after filtering gets cloudy again —

May be dissolves out free
Resin — Try alcohol —

Old books

The Bengal Resin gives no Buffer
Coharood (1-26-16 it may if dissolved in alcohol)
Hard to say which Resin does the
business —

1500 grams Sandrac dissolved in
Benzol 1/3 is soluble, the Resin
Sol of Benzol is gummy stays
semi Viscous on half plate at
240 fahr for days without
Change —
The White Insol is 2/3 of all

"Condensite Van in Blank
powder NG without condensing
with 6/4 in Vac Dryer

Records Cut Wet then washed
them in Soap + water, then they
no longer Cut — (possibly action
of free Soda)

Old Book notes

Plates Coated with Sesame Oil
Cause Varnish to leave plate
whole in oven — so they were
Entirely detached —
Says Very pleasing
3 hum heat 2 Contact 10 of Gooll

Chloride Ammonia gives all
transfer OK & free of blemishes —

5 c/s Acetate Magnesia 12 Trans
11 OK 1 Ckd near hole & peeled
" Beautiful Yellow very
Even & attractive —

Varnish thinned by adding
alcohol NG
The thicker the better —

2-4-16

Experiments on Varnish — 9
notice that thick Var entirely of
plain Sandrac dissolved in Alcohol
Wenat (our req) has enormous
number worms all connected
Count very of on balloon or lap
also considerable number
very fine bubbles —
The skin formed is tough or
forms the moment it is flowed
on plate —

No A Expmt
Run in Water Jacket oven 6
1" discs 5 of them req Var
#1 had 2 when put in - after had 3 one big
2 none after bake
3 none
4 had 11 -
5 none

a Sandrac plate. Whale of Sandrac
dissolved in Alcohol 13 bubbles

The Schedule of A Experiment was

Dried 2 hours in air

Started 4 pm

Reached 100° Fahr at 4.30

125 at 5.00

135 at 5.30 –

Took them out

Experiment B

Reg Van dried 2 hours in air

no bubbles on any

Start at 6 pm –

" arrive at 100° Fahr at 6.40

120 7 30

130 8 20

1st Bubble appears 135 9.00

140	9 40	
145	10 30	Not Condensing
150	11.10	
155	11 50	
160	12 30	
165	1 10	
170	1 50	
175	2 30	

all small apparently on Top

most to test condensing

Final run

2 for 1st 4 small

2

none

4

1

used for test

100 grms CP Soda process Resin
16 " Alcohol
100 mlg Paraphenylendiamin

# 8	275 mlg 6/4
9	300
10	325
11	350
12	375
13	400
14	500

S S
a b

I notice a great PHENOMINON
13 14 being 1/32 thick are
not fully Condensed, Cut like 1/2 flex shown
Condensed stuff whereas thin
parts are hard Elastic brittle, + →
fully Condensed at this schedule
This is very bad,

Experiment with Soda Resin Alcohol free

	%		
# 8	$2\frac{3}{4}$	6-4	Exceeding soft hot no brittle
9	3	"	Lift not quite so soft
10	$3\frac{1}{4}$	"	Lift not so soft Cuts brittle - Veneer Cuts
11	$3\frac{1}{2}$	"	Lift fully Condensed as compared to 8 + 9 "
12	$3\frac{3}{4}$	"	
13	4		Cuts Very	rough seems plastic ? ? no spring
14	5		Best cuts even in thin sections
15	Req		Cut like Celluloid but not much
			better than req on this schedule

Water Jacket oven Dried 2 hours air

1 hour to	100° Fahr	2 Pm
	115	2 30
	125	3.00
Several bubbles on	135	3 30
Each.	145	5.00.
	150	6.30
	155	8.00
Wants more	160	9.30
6/4.	170	10 30
I think	180	11 00
	190	11 30
May want 8 flows	200	12.00
	220	1 .00
	235	2 .00

No Cracks

Req on this schedule is tougher on bending
Cuts just as tough has less bubbles + better
than any of the others

Trioxymethylene Experiments.

CP Resin by Soda process — no free phenol —

Not sol Alcohol
Alcohol + HCl
" + NH_4
" + Benzol
" " + phenol
" " " + Water

Must find a Solvent first,

"

Watts (new) says, Trioxymethylene in sealed tube with very small quantity H_2SO_4 — + heat is made soluble in Water + Alcohol Lauro Ok — Trying it

Note — Phenomenon

The Alcoholic Solution thick Varnish from the Sandrac which is insoluble in Benzol on drying Cracks in thousands of pieces on the transfer plate As a Contractor + Cracker this takes the Cake

The portion soluable in Benzol — Clear free of Benzol + a thick Varnish made by dissolving in Alcohol Evaporates down but does not Crack it will stay for days on hot plate + not change just thick —

+ This of course would not work as well in Reg Var as the other —

Moore

Set aside over book case in Balance room Chem Lab

20 Regular Records 2 (2 rollers between —

two Cages of Reg transfer plates

two Cage 116E transfer "

The 120 + 121 E Records

Records of 129 E + 130 E

He is attending to it

Moore will put ~~to~~ a Cage of Reg flowed Reg Var plates aside for 2 weeks —

1 Cage 1 week —

146 Records also Thus 6/4 thickness

Got from Baldwin 12 Recent records
Reject for Crack.
Nearly Every one radial short cracks

1 - 1/2 in on music - angle 15° 1/2" long
2 1 1/2 long Radial - from ~~Circular~~ Edge of
3 1/4" in Music 1/4 long radial
4 one 1/2" radial 3/4 long another 1/2" to the left further in 1/4" long
5 starts Edge 1 1/2 long radial bends left at end
6 5 cracks 1/4 long Each starts 1/8" from Edge
7 1 mark in 1m Radial 3/8" long - Opposite record has another 1/8" from Edge goes 1/8" in Music
8 groups short Cx 1/8" from Edge, scattered in Music
19 starts at Edge radial 3/4" in Music
10 " 1/8" from Edge goes 3/8 in Music radial
11 Fibre
12 Radial at inside edge of Music 5 Crax 1/8" each

100 grms 6/4 requires for Taking
Care of the Ammonia evolved on
the reaction of Condensation

355 grms Boric acid
229 " Glacial Phosphoric
206 " Citric
180 " Oxalic
105 " HCl

None any
good

Formaldehyde Combines with
Diamid - (Hydrazine)
Ammonium Cyanide -

Trioxymethylene Combines with
Diethylamine -

Aniline -

100 cc Mercks old Aniline Oil Pure
54 cc Formaldehyde in
flask with Reflex tube put
on hot plate sitting on a Buffer
dish — 9 min — to Condense it

Above 100 phenol to 54 formal is
proportions we use

Only goes to a white resin
& no amount of added
Formaldehyde makes it harder

153E Used too much Boric, when plate dried before oven, had horrible surface –
on baked Each plate has 4 to 6 1/32 bubbles + a scum of microscopic bubbles on surface
Went less Boric so it would show good surface ~~and~~ before putting in oven

Stripping it from plate & placing it on hot plate covered with the plate, boils up & makes a porous sponge

NG not promising

Experiment to Combine an acid in the Varnish to take care of the Ammonia given off in the reaction –

Used CP Resin Soda process

153 E Expmt

10 grams Resin –
16 " Alcohol
100 Mlg Para
500 Mlg 6/4
1.775 grms Boric acid
300 Mlg Water

OK Works OK
on plate –

Condensing Spongy
ng

154E All puffed up & Gooed
NG Hopelessness

154 F

10 Grams Resin - CP -
~~16 Alcohol~~ 5% NaOH + little alcohol
~~100 milg para~~ no para
500 " 6/4.
~~1445 grms phenol phosphoric acid~~
300 milg coater

~~AG~~

~~Dont disclose &~~
~~Prescipes out 6/4~~

155 E Each plate has ~~[illegible]~~

1 has 2 tubes 015 3 of 008
2 " 2 " 003
3 " 2 " 020 3 of 005
4 4 " 005 - note

Vardisc Very thin - has celluloid Tough cut not fully Condensed - it is flex - not perfectly Elastic

After further Condensing on hot plate it still Cuts somewhat like Celluloid

NOTE I stripped it from plate laid the outside surface next the hot plate for 10 min putting a plate over it

Now there is a reversal the strength of breaking is now with the inner side (IE) the side next hot plate) in Compression - This is what occurs in Transformering

Aniline may or may not be of Value it works OK in CP Phenol free Resin -

155 E

10 grams CP Resin
16 " " Alcohol
100 Mlg Para
575 " 6/4
~~900 " Oxalic acid~~
1.500 Aniline oil -
300 " Water -

Preceps 6/4

Substitute

1 1/2 grams Aniline Oil

156 = ~~Dotheduler~~ group of 153E 154E 155E 156E

Cold 1 pm

2 "	100°	60
2.40	115	40
3 20	125	40
4 pm	135	40
5 "	140	60
6 "	145	60
7 "	150	60
8 "	155	
9 "	160	
9.40	165	
10 20	175	
11 00	180	
11.30	190	
12	200	
12 40	215	
1.20.	235	

160 - 9 hours

Citric Very soft on rollers on hot plate ~~[illegible]~~ strip lots pieces - hanging on hot plate bubbles comes up - raises
after Condensation on hot plate stuff fuller
Very soft hot - brittle freezable Cold
NG - 20 or 30 ~~[illegible]~~

on rack plate

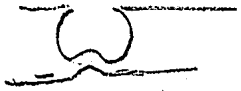
156 E

10 grams CP Resin Soda process
16 " Alcohol
100 Milg Para
500 " 6/4
1 grain Citric acid
300 Milg Water -

" Works OK Except Para dont go in very well had fillers some black clots out.

C = Most of the Veneers are 1/16 thick
+ these are Not hard Condensed
Except a couple of thousandths
on outer surface + on thin
Edges - the balance Cuts like Celluloid
long shaving tough —
The whole has usual Brittleness

Have put them back in oven -
1 Taken out 250° Looks OK some bubbles
16 has shrunk to 1/32 - Still Cuts like Celluloid
on thick part - hard on surface
It bend better than 235 stiff -
but touching edge with knife
275 - left the plate free 55 " Phenomenon
It has shrunken to about 25/1000
Fully Condensed - dont cut like Celluloid
Not very tough but Elastic, + strong after annealing
Right on hot plate softens OK bent double
dents good when hot -
The bubbles at bottom shrunk in



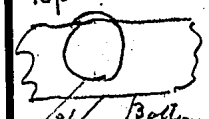
300 - Touched Edge point knife left ~~edge~~
plate perfect - thinner still 15 to 18/1000
pretty strong

325 When cool both left brass plate
perfect in shape ~~the~~ loose, put plate
Bender + dents - I think this too hard

Experiment C in Water Bath
Dried 2 hours in air
Reg Var - Been in Tec Chamber 3 days

Started 1230

got to..	100°	at	1.00, pm	60/1000
	115	at	1.40	
Bubbles are	125	at	2.30	if 15/1000 there
top bubbles	135	at	3 10	would be no
	140	at	4 10	bubbles
	145	at	5 00	
	150	at	6 00	
	155	at	7 00	
all are about	160	at	8 00	Condensed
8/1000 from	165	at	8.40	Big bubbles on off
Bottom				
"	170	at	9 20	
	175	"	9 50	No increase of
	180	"	10 30	bubbles after 165
	185	"	11 00	
1/2 hours	190	"	11 30	
	200		12 midnight	
	215		12.40 -	
	230		1 20 am	



The plates 1" are poured very heavy
This probably accounts for bubbles
Bubbles dont go thru to face of
plate -

OVER

Think we can go higher on our schedule
Rig up an oven for a bird Cage a

Starting up to	250	1 hour	Rig plates
Another Cage	275	1 hour	
Another "	300	1 hour	
Another	325	1 hour	
Another	350	1 hour	

Phenomenon

I notice the stripped Veneers are 3 times stronger when bent so outside is in Compression, than it is opposite,

157 E

Blanks made from Fuller Mill — 90% Thru 180 - Coarse left in not screened

Use Regular Transfer plates

Blanks Calliper 225 high 210 low 500 grms 500 lbs on small press 7/8 ring 1/8" scrape 1/5 + wt 394
12 blank all OK

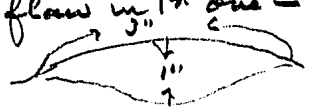
~~[illegible]~~

present 6 - 30 OK 1 prop put 2 Crack Marquin
11 Trimmed 10 OK 1 small blister - all released free

RO	Fine |||||||||	
1 — 1		
2 ||	good |||	
3				
4				
5 ||	fair	The Coarse powder knocks it out.
6						
none	Ruff	Weld poor can run knife under to chip off 1/4 dia chip. Must get better weld on fine grain blank. Either Lampblack or Mtg Cl — Edges are fine

5 ft drop — 1 broke 1st drop
2nd " Drops + didnt break -

Must Gear flow in 1st one — it was poor present



158E

Alcohol saturated at boiling heat with acetate of Magnesia takes up very considerable filtered it. The Alcohol was 86 cc water 14 cc —

Used 10 CP Resin Soda process
16 grams above alcohol
Containing Mg acetate
100 mlg Para
500 mlg 6/4

" Had to add a little alcohol
Resin very hard to dissolve
in Solution —

1 = 3 large 100 tubes - all unseaded
Its a big lift - gas
Solid part sticks to plate - dull appearance
Not quite condensed
Not promising —

Aniline 100 cc Formaldehyde
54 cc Condenses it to a
white right off – fresh
formaldehyde & prolonged
heat dont condense it
any more its a soft
~~fatty~~ solid – melts on
hot plate after cooling
its the ~~same white~~ to red resin soft
~~pretty like a fresh soap~~ and sticky –

I have put some along
6/4 Sol in Water in
to see if it carries further
The white stuff not soluble
in alkali 10% or alcohol

This is the schedule we use

30 min	To	100° Fahr
40	"	120 "
40	"	125 "
60	"	130
60	"	135
70	"	140
80	"	145
90	"	150
100	"	155
150	"	160
80	"	165
60	"	170
50	"	175
40	"	180
40	"	185
30	"	190
30	"	195
30	"	200
30		215
30		225
30		235
30		Hold

Safest Schedule

Safest

Air cooling this

this in now water jacket oven

Afterwards
250
295
300
325

17½ Hours

18 Hours

Proposed Safe Schedule for Experiments

30 minutes	to		100°	100	100	100
60	"	"	120	120	120	120
60	"	"	125	125 —	120	115
60	"	"	135	130	125	120
70	"	"	140	135	130	125
70	"	"	145	140	135	130
80	"	"	150	145	140	135
100	"	"	155	150	145	140
90	"	"	160	155	150	145
70	"	"	165	160	155	150
60	"	"	170 —	165	160	155
50	"	"	180 —	170 —	165 —	160
40	"	"	185			
40	"	"	190			
30	"	"	195			
30	"	"	200			
940						
30	"	"	215			
30	"	"	230			
30	"	"	235			

16½ hours

60) 940 (15 Hours 40 min
600
340
300
40

This is a serious defect – This would not strip from plate as it was not Condensed Enough

The big bubble $\frac{1}{16}$ in #1 is on top burst open – probably .015 wall next to plate,

bends thus

much – on the Even one before breaking

159E ✓

Make some regular Var
10 Raq Resin 16% Resin
16 Alcohol
100 mlq Para
100 mlq Benzol Sandarac
no free phenol.
4 Discs 550 mlq 6/4

Safe Schedule

1 –	1	$\frac{1}{16}$	2	$\frac{10}{1000}$	all Top
2	1	$\frac{1}{32}$	1	$\frac{15}{1000}$	1 .005
3	none.				
4	2	$\frac{1}{2}$	1	.010 –	

Not loose on plate – flowed to one edge on some No 3 plate even*

by getting Knife under edge it stripped off perfect An Even plate Calliperred Center .018* perfectly Condensed

Another one that went to side Calliperred .064 & was not perfectly Condensed and like soft Celluloid see left hand page

160 E ✓

10 Reg 16% Resin
16 alcohol
100 Mlg Para
400 " Bengal Sandrac
550 6/4

4 Discs

Safe Schedule

in thick part

1st	1 1/16	1 040	1 035	2 03	1 015	
2	none					
3	1 010 —					
4 1	1 1/16 - burst					

No 4 - has thick part yet it came off plate by cutting around edge of plate + trying to under run with knife Big part (10) thick part Callipers 050 - Big bit has very little wall next to plate

Thick part Cuts like Celluloid but harder than 159 E

All plates have run to one side Cant make breaking test

None of the others have Cks because no bubbles where very thin

#3 ——— Cracks

3 - Callipers .031 - not fully Condensed in thickest part.

This is Sandrac

161 E ✓ ✓

10 Reg resin 16%
16 alcohol
100 Para
800 Mil'g Benzol Sacccdrac
550 " 6/4

4 Discs

Safe Schedule

1st	3 of .025		1 .010	
2	1	.050	1 .030	
3	1 $\frac{1}{16}$	.050	2 of .020	
4	.030	.020	2 of .015	2 of .010

Where even fully Condensed - Callipers Center .040 -

Leaves plate when under run by 1 ounce
It also shows that at some time in process it has lifted clear of plate 1/2 its area but shrunk back.

No 1 Shows at thin part a lot of Cracks in all Cases starting from Bubbles
the B. $\frac{1}{32}$ area no crax from the .010 bubble

162

Does not curl much on hot plate after 1½ hours
Cuts very hard - rather brittle even hot
but cold its strong

8:6/4 seems altogether too much 6/4 for our records

If Veneer plates could be made to stay on plate + transfer + print OK dont think the veneer would ever change or crack as it would be set + chemical changes fully carried out.

On hot plate 12 noon
at 3'20 - Very hard to dent or bend. not flexible at all

162 E ✓

10 Resin 16%
16 alcohol
100 Mlq Para
100 " Bengal Sandrac
800 " 6/4
600 " free phenol.

4 Discs

Dafs Schedule

		plates unseven thick		
1	2 of	030		
2	2 of	010	2 of	003
3	1 of	030	1 of	020 in the thick
4	1 of	020	1 of	010

Hard to strip - got 7/10 off 1 piece no left
Condensed nearly all - cuts hard in thickest part
Cant get breaking test

Try hardness on hot plate + also
Run to 325° -

163E

Hoffman Reg Var
not filtered

4 plates

of the 4 put them accordingly
with 164E to get same
Conditions
Date Schedule

164 E

Hoffmann Von

4 plates Filtered

Safe Schedule

165

Does not curl much after being on hot plate for 1½ hours

on 12 noon at 3 30 pm dents good -

6 pm off to test fully Condensed hard Cut - fairly flat, softens will dent ~~Dent~~ it OK -

put back at 6 pm

165 E

10 CP Rosin Soda process
16 alcohol
100 Mlg Para
300 " Benzol Sandrac
400 " 6/4

4 plates

Safe Schedule

1	3 of	050 -	4 of 004	1 of 020
2	1 of	015	2 of 003	
3	2 of	015		
4	1 of	050 -	1 020 chafing	

Cannot get off plate -

Run to 325 - + test on hot plate before running to 324

Chipped piece out, thick part only horn Condensed =

This is pretty hard dont curl lays flat on hot plate for 1½ hours It dont dent wall or is very little plastic not sure it will permit of printing —

On hot plate 12 noon at 330 pm flat & can scarcely dent at all

6 pm —

Cuts very hard, nicks it gave on broken Edge Cracks but not nicked on Edge

no sign of horny cut family strong

550 = 6/4 a little too much —

300 Sandrac is bad —

166 E ✓

10 CP Resin Soda Process
16 Alcohol
100 Mlq Para
300 Blazal Sandrac
580 Mlq 6/4

4 plates

Safe Schedule

1 = Left plate - blistered 3 bubs #120 blister 1 7/8" dia 3 ¼" dia several ⅛" dia
It is nearly condemned at 060 thick - this would be ok.

2 = Blistered 7/8" ½" ¼" several ⅛ + clear
Loose from plate with slight jar

3. Blister 2 7/8 × ½ 2 bubs 060 2 of 020
Loose by slight jar

4 1 bub 040 1 020 1 ¼" blister high

167 ~ Hoffman Reg — filled and Varn
Wipe plates Alcohol
4 plates
Safe schedule

168 -
Hoffman unfittered Van
finger Marks all over plates
Use alcohol -
4 Dwn
Safe Schedule -

Actual Schedule 158 To 181 tests run

230 pm	Cold		
3.00.	97	30 min more to	218
3 40	120	30 " "	225
4 20	126	30 " "	235
5 20	132		
6 20	138		
7 30	140		
8 50	145		
10 20	150		
12 00	156		
2 30	161		
3 50	165		
4.50.	169		
5 40	175		
6 20	180		
7 00	184		
7 30	192		
8.00	198		
8 30	200		

It varies on a min or two from Safest Schedule on other pages —

169 -

Hoffmans Reg - followed Von

Wipe plates with rag 10% NaOH, & ~~clean~~ afterwards clean rag

Use alcohol

4 Dec

Safe Schedule —

170

Hoffman filtered Van

Put plates on pad of paper so Top gets heat.

4 Discs

This makes 5000 holes in face of
blank for dip varnish to run in
30 seconds polish holes à 1/2 the
size — 2 min NaOH, Holes
very large & ∞ & like this
takes up 1/3 to 1/2 the area —
Think KOH penetrates 1 1/2 @ 2/1000
underneath fine shiny
surface — Its the ~~[illegible]~~
highly condensed shell that
is approximately attacked
Moore's 20 sec 10% NaOH
will be OK
Alcohol dont change it.
Note = If after NaOH stuff is dry &
break HCl put on it & dropped
dry cracks run from Hole to
Hole - Enormous Shrinkage
15 Min NaOH, 90% attacked net work
but by scraping cant be over
.002 deep -

131 E Moore didnt make -
Use 10% Soda solution
flow over 20 second rinse
off under hydrant do wipe
Dry & transfer 12
Red Var 1293 90% fuller
Mill material — also 30 sec
& 12 more 131 1/2 E

Notice surface action &
microscopic pits which
should anchor

Note if I leave the 10% NaOH on 1 min
it eats out holes about
60 holes in area of Micro 1/8 I believe
Seems as if they were invisible bubbles
& NaOH eat out the fine lap film & Exposed
them they are practically all round

Submit work for week with Resume

No

171 E v

10 Reg Resin —
16 grms Alcohol
100 Milg Para
550 " 6/4
800 " Sandrac Insolin Benzol —

1 = 8 blisters 3/8 to 1/8 4 bubs · 062
Loose by Knocking Fully Condensed

2 Loose — 4 — 0/40 bubs 2 blisters 1/8" 1/4

3 Loose Big blisters no bubs

4 mostly loose 1 3/4" blisters bright 2 050 bubs

172 E ✓

10 grams Reg Resin -
16 " Alcohol
100 mlg Para
560 " 6/4
200 " Dandrac Insolin Benzol

1 = 2 tubs - 040
2 Slip plate thick part not quite condemned
3 5 group bubbles " 008
4 no bubbs —

Not strippable dont see any lifts -
Runto 325 -

325# Condemnation Shows Veinous
hard lifts + broad connection opening -
Not necessary

Note — Started 230 Safest Schedule
1020 pm Temp 150

173 - has 1/16 bubbles 3 or 4 to each
seem to come in the Varnish - not on top
This Var was very thick + viscous
when flowed, should have had
more Alcohol

161 has a few Top bubbles small

159 - 160 No bubbles

176 - 177 - 178 - 179 - Have no bubbles

180 - 181 - 162 - 165 - scarcely any

166 - has few small bubbles
171 172 + 158 none

173 E ✓

10 grms Reg Resin
19 " Alcohol
100 Mdg Paral
550 " 6/4

3 grams Sandrac Insoluble in Benz

Had use 3 Extra Alcohol to get it
to dissolve the 3 Extra grams
Resin of Sandrac

1	1/8 -	2 of 050	2 of 040	1 020
2	Whole 1/4"	1 1/8	2 of 040	
3	2 of 1/16	2 of 050		
4	1 of 060	1 1/16	Elastic bubbles	all underneath

Has lifted in several places slightly
It is not condensed - brittle,

None free from plate —

Continued from preceding page

First section 157 130 am

Row 1st first 1 bubble. 159

2nd 5 on 1-1 on another 160

3rd 4-2-2-5 bubbles 161

4 6-3-3-1 " 173

Row 2nd

1	2-1-2	176
2	1 1	177
3	2-2-1-1	178
4	none	179

Row 3 -

1 -	none		180
2 -	2-2-1-2	small	181
3 -	2-1-2-1	fine	162
4 -	6-4-2-2		165

4th Row -

1 -	big big small small 3 - 5 - 2 - 2		166
2	5 - big 4 0 1 small		171
3	2-1 0 0		172
4	4-2-4-1	all big	158

174 E Moore Bring down 2 Cages filled with Transfer plates that have been run the oven - ~~[illegible]~~ I want to run them up to 325 Deg Fahr, & if they come loose will print them on Short Schedule

Those that dont come loose ~~[illegible]~~ transfer on short schedule - & then print on short schedule

175 E Moore 2 bend
Cages full of transfers
that has been there
over - I will run
them to 275 deg
your transfer them
on 10 minutes schedule
of Print

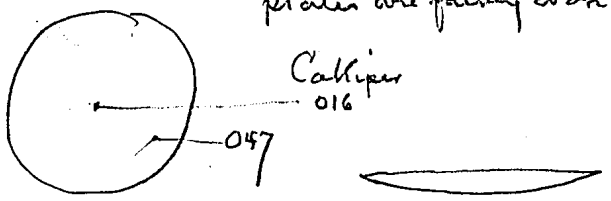
4 had left plate in oven & curled up

Test softening on Hot plate.

176 E ✓

10. Reg Resin
1.6 grms Ethanol
100 mlg Para
780 mlg 6/4
100 " Benzoal Coumarac
600 " Freethenal

1 = 5 of 060 3 of 040
2 1 of 040 1 blister 050 1 blister $\frac{1}{8}$"
1 bubble open to plate
3 2 - of 025 open clear to plate - 2 blisters
$\frac{1}{8}$" dia show dent next plate dark
Examine with Micro -
plates are fairly Even



' Condensed nearly if not full.
All leave plate by a slight jar

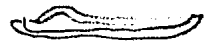
Try softening on hot plate

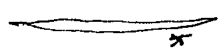
177E ✓ ✓

10 Reg Resin
16 alcohol
1.00 Mlq Para
100 " Benzoel benzoate
750 " 6/4
600 " Hex phenol

4 = 1 040
3 None
2 1 Clear thin 015" 1 blister dark 1/8"
1 small thicker 035
1 1 025 Clear thin

All free from plate – 3 flat 1 curled a little, had nick 1 with knife





but the not flat

* Calipers of broken 015" thick 030

fully Condensed no lifts (except the Curle) on + that shows no sectional lift

Try coflowing on hot plate

178E ✓ ✓

10 grms Reg Resin
16 " Alcohol

100 mlg Para
100 " Bengal Sandrace
725 " 6/4
600 " Free phenol

1 1 050 Clear thin 1 020 thin 1 020 thin
Curled up no previous signs of seaboard left.

2 1 clear thin 030 2 of 010. nearly thin flat

3 1 of 030 not thin 1 of 010 not thin flat.

4 - 2 of 025 not quite thin, it lifted during process now flat.

All lose from plate by jarring

179 E ✓ ✓

10 grms Reg Resin -
16 " Alcohol
100 " Para
100 " Benzol Sandarac
700 " 6/4
600 " Free Phenol

flat
1 none
2 none
3 none lifted 2 places now flat
4 none

The brass plates slight jar came off
Nickel required very hard jars -

by Cutting No1 face of bend + underrunning
with Knife came off with 1 Crack nearly
to Center – These will not stack to
plates in Transferring – Even thin – Thin plate
Thick thin
Calliper 023 013

Thin

is Cracked one

1 at thickest is nearly condemned not quite

3 got of uncracked by underrunning with
Knife starting thickest Edge + perpendicularly
scraping off top Edge
Calliper 003 thickest 018 thinnest
Bend

Nearly Condemned, + OK on thickest part

Tough Cut in thinnest – This is good
Var at This schedule Even with above
Calliper of + surfaces OK –
Try hot plate –

180 E ✓ ✓

10 grms Reg Resin
16 " Alcohol
100 Melq Peora
100 " Benzol Sandarac
675 " 6/4
600 " Free Phenol –

1 no bubbles
2 "
3 "
4 "

fairly Even plates.

1st Hard to strip get off. 3/4 of a complete disc showing it will become good, not quite fully Condensed in thick part. think it fairly Tough - believe this is ok Varnish, Run to 325 + cooler test on hot plate -

#4 on knocking Crackles starting from bubbles - will not come off.

181 E ✓ ✓

10 Reg Resin
16 Alcohol
100 Melq Powder
100 " Benzol Sulfonamide
650 " 6/4
600 " Tricresol

1 = 2 020
2 1 040 2 010
3 2 Smooth donut thinnest thing and Crackle
4 3 of 010 1 020 top -

Plates fairly Even

Oven test -

	With Negrosin	without Negrosin
Raised	16%	0.7%
Wrinkled	1.5%	4.1%
Chipped	5.3%	1.5%
Dimples	—	2.0%
Uneven	2.0%	0.0
Bubbles	4.0%	8.2%

	Passed	without Neg
OK	70% as follows	83.3%
OK Uneven	1.3	0.0
Small Bubbles	00 OK	63.5% OK
Palished	3%	0.3%

Notes -

Dis of Phenol resin dissolves in the following

Naphthalene
Paraffine
Ceresin
Carnauba
Oleine Pitch
Lanolin
Tetrachlorethane
Artificial Camphor
Bengal Sandrac
Aniline Hydrochloride
Tetrachloronaphthalene
Manilla Copal — also of Manilla Copal S of Alkyl
Candellilla Wax
Montan -
Native Camphor

2-7-16.

1412 500 grms 500 lbs press small Press

Blades on loaders lowered slightly
Powder packs close in the loading Machine
Extra bottom plate used to raise the mould to clear hammers
No extra bottom plate used in small press
Powder packs close in small press
Lifts showing up running Zig Zag from center of mould to Margin.
1/8 inch Scrape off on Turn Table
Weight of blanks 410 grms
Calliper 210 to 220
Color Light center dark + small specks
Leaves moulds cloudy with small white specks.

Phenomenon When a blank (1412) Callipers so there is only a difference of .007 no RO + it ✓ or ✓ of 12 to 20 it shows RO in proportion to out of Calliper all should come could .007 to pass

1293 Blank - is
5 Wood 2 Chalk 2 Lac

No **1412** will be the blank with the above proportion ground in a Fuller Mill 90% thru 180 mesh with the Coarse Sifted out so all goes thru 180 mesh by a Newago Screen Screen does 300 lbs hour 180 fine —

Those which Exceed this limit try pitting against fewer plates + truing up with a Diamond Tool

182 All released freely

RO
1 Finest
2
3 good
4
5
6 HHH 1 Finest surface Ever attained —
Non ||

The edges of our blanks must be built up -

4 printed None OK all poor Margin 1/2 to 3/4 in

Inclic at points of good pressure the weld is good 1/16 chips scarcely can undermine knife -

Want Lampblack well mixed. 5% in Dip Varnish to get finest surfaces

182 E

1412 Blank 1293 accepted 180 mesh - Fuller Mill & Hawkings Screen

Standard size - Dip Transfer 12 with Even flow plates Reg Var Print 6 -

Transfer 12 1 OK - 11 big blisters

Where lifts are blank shows big hills - This shows that after dipping we should bake plates Couple hours not cleaner 135 Fahr to get all muck & gasses out = Looks as if we could be bothered with big lifts, may have to make blanks at lower than 1000 lbs - or use Thicker Var or get Even plates

Footefer

Ro Fine IIIIIII

1 — 1 good IIII

2

3

4 III fair 1

5 IIII

6 III

none Ref.

Wants Sample Check

Baking causes pits in the blank - not good

Welds where good Edge very good
Where Uneck Varnish on edge
poor weld Can render run 1/4"
+ not 1/16 where good Edge

183 E

1412 blank dip in regular way - dry 1 hour then put in Oven and dry 2 hours at not over 135 degrees

Yahi — Use Even plates

Transfer 12 Reg Var

Print 6 —

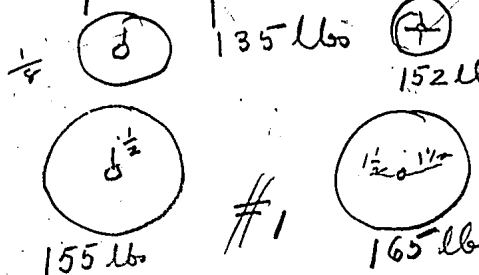
Transfd 12 11 OK 1 Left cracked

Print 6 - 6 OK Except 3 poor margin

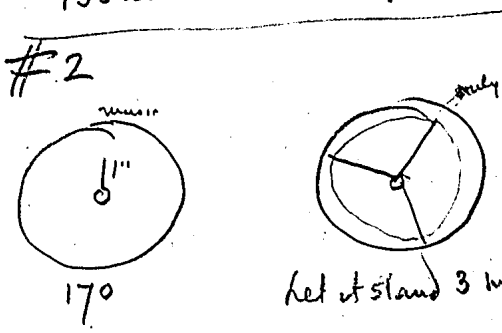
78B Reg Blank, phenolfree 16% Resin
6 6/4

Breaking Tests

78E Record



#2



1226 - Record - Transf blank in oven to 160 Fah
Kept 160 for 1 hour then to 180 - Kept 15 min
then raised to 210 kept for 15 min
plunged in Cold water 30 Fahr.
Record 147 lbs 3 Ckd 3/4" long 6/64 dished
showed a Crack 1/16 long at 40 lbs
otherside - 160 lbs broke 6/64
Ckd 1/16 long at 40 lbs
Blank 193 lbs 2 Ckd 3/8 long 8/64 dish
was ckd 1/16 before test
otherside 203 lbs 1 ck 5/16 long 9/64 dish
showed 1/16 ck at 40 lbs

Breaking Tests

	lbs			
Muscup	169	1 = 1" ck	Dished	6/64 - 90/000
" Down	160	2 1 1/2 "		6/64 Dished
Muscup	200	3 Ckd - blank broke		7/64 Dished
Mus. Cold Expanded				
Muscup -	192 lbs	- 1 ck 1"	7/64 Dished	
" down	207	4 Ckd Collapsed	8/64 Dished	

30% ground blank in -

1226 - Reg - Annealed
Put in oven & heated to 160° Fah
for 1 hour plunged into 2 co
water 30 Fahr (salt) -
No Cracks

Break Test

Record

180 lbs	3 Crax	3/4 long	7/64 dish
170 lbs	1 "	1/2	7/64 "

Transfer

205 lbs	1 crack	1/2" long	8/64 Dish
193 "	1 "	1/2	7/64 "

See further on

184E

RO fine ||||| ||||
1
2 good ||||
3
4 || fair
5 ||||
6 ||||
now Ref -

184EA

RO fine ||||||||
1
2 good ||||
3
4 | fair
5 ||
6 ||||| |||
now |

184E No weld - Soda dont do it
Can under run Knife 1/2 mesh —

Dipped is slightly better

Dipped one weeds four under run to
bring off 3/16 chip —

Note 185 X all fine - these
very few - SODA BAD

Not Dipped 184E 6 Transfd 6 OK -
Print 3 cracked Marqui 1 poor print
1 chipped Marqui by punching Mesh
1 OK

184EA - Dipped - Transfd 6 6 OK
Prints 4 OK 1 OK Marqui
2 poor prints

184E See ahead

Take 24 Reg Van plates
Wet all over with 10% Soda
Keep soda on for 30 seconds
wash off with Running water
Wipe dry Dont Dip
Wait till you get 12
1412 blanks + transfer
12 print 6 —

Flow soda over thick after 30 seconds
wash off by holding under faucet
Shake + wipe dry

184EA Dip but dip the
blanks

185 EX See pages ahead for a Reprint

Will Dup. Hoffman grinding Lampblack in carpaint mill —

Dup 24 1412 blanks bake at 130° for 2 hours

Transfer with Req Var

Print 6 —

Transfd 12 8 OK 2 Cooked Carbon 1 Lift Ckd —

Printed 6 4 OK 2 poor print

RO	fine
1	
2	good
3	
4	fair
5	1
6	~~III~~ IIII
none	II

Very good Weld

1/8 chip generally less

Lampblack good

should be ground finer to get it better Can replace Negrosine

185

Blanks 90% Burn 180 — fuller mill grinding

Dup Varnish has 5% Lampblack —

3 Transfd 3 OK

Print 3 OK —

RO	fine
1	
2	good
3	
4	
5	1
6	II
7	1

Weld good where music is —

Moore didnt grind it just stirred it — Must be ground

Reprint 5 — 4 OK 1 pp Comet

RO	fine
1	
2	
3	good II
4	II
5	I
6	III
none	IIII

Breaking tests Continued

2 Discs from 117 E
Calliper 240 -
170 lbs - dished 5/64 2 Cks 1½ Long
Record down
170 lbs dished 6/64 3 Cks 1¼
2nd average Calliper 250 -
172 lbs dished 5/64
2 Cks 1" Long
Record down
160 lbs dished 5/64
3 Crack ½ to 2" Long

124E Calliper 265
Musicup 160 lbs Dished 5/64 1 Ck 1" Long
Down 200 lbs " 7/64 Cks 90° deg apart

Calliper 265
175 lbs Dished 6/64 1 Ck ½" Crack showed up 1/16 long with 40 lbs
Musicdown 166 lbs dished 5/64 - 1 Ck ½ long
Cracks 175° apart.

126E
115 lbs dished 4/64 Calliper 175

another Calliper 175
80 lbs broke ~~[illegible]~~

182 E 1412 Blank (New) — finest surfaces yet attained
Calliper 235
Record up - 195 lbs broke - 7/64 dished

Record up 80 lbs 3 crax 1/4" long 2½/64 dished
Record down 170 lbs broke 6/64 "
225 thick -
Break Very Suddenly

Noticed Edges Cold Slow
Not Crack

11 Reg Records Reg Blanks of Value
Calliper 248 - 210 lbs broke 9/64 .140 dish no cracks
Calliper 230 183 " Ck 1" long 7/64 " .109
175 Ck 3 of 1" to 2" 7/64 " .109
Calliper 230 130 Cks - 2 - 3/4 long 5/64 " .078
148 1 Ck 3/4 6/64 - .093

	Dished	Calliper
Broke 210	0.140	248
183	0.109	230
175	0.109	
130	0.078	230
148	0.093	

SEE OVER

1412

Calliper	Broke	Dished before bkg
235	195 lbs	.109
	80	037

2—7—16

Resume of Experts
158 to 181 — I believe that
16% Resin 6 free phenol —
1 para 1 Benzoldehyde Sandrace
with
7 — 6.75 6.5 6/4 + what
I call safe schedule to test
varnish in that series
+ that 6.75 is the best
until I see result of last
run in oven to 325° Fahr
to see if soft enough + flexible
Enough for transfer + paint
6.75 6/4 bends best of those
I could test.

I believe 6.5 is OK + Even
6 will be OK —

Notes—

Lots 158-159 160 161 162 165 166
171 172 173 176 177 178 179 180 181
tested after Safe Schedule — + after
they had been run up to 325° Fahr

All plates had loose + free veneers
that didn't have on 1st schedule
to 235° — all thin + very
hard

179 — slightly curled — put on hot
plate + weight put over for 1/2
minute forced it cracked clear
across.

picked this up quick + bent

then broke showing it was
very hard + probably might
not make a good field on

pressing — 179 is Reg 22% free phenol
Van 17% 6-4 —
Cuts very hard but dont break out much

One disc bent like this
thickest part is about 036
which shows its has great bending
power Hot plate is 286°

180 perfectly flat disc — bent thus hot

also it dented when hot showing it
will permit OK — it bends cold even
better than 179 — ~~[illegible]~~ Calliper
~~[illegible]~~ thickest part 033.
better preparation apparently than
179

181 a knife shows dent + will permit
but it dont bend hot as well as 180
+ 180 not as much as 179 —
Evidently 179 bends better hot +
the extra 6/4 condensing it more —

162 = bends ok on hot plate, bends cold fair
Cuts hard. not chipy

178. Softens Easy dents easy bends on hot plate
Cut ok but hard
it bends fairly good
no brittleness about it - but all are a little Curled by the higher temperatures, They seem to be thicker than 179-80-81

177 - bent -
put it Convex side down on hot plate & weight it went flat in 20 sec removed plate it Springing back thru
It dents ok.
Left on hot plate weight on two minutes springing back thru
nearly flat on hot plate after 5 min under heat & pressure, after Cooling springing back a little
shows time will take Elasticity out somewhat.
bends cold
Cuts little more brittle than 79-80-81

When thin bends very good - think its thicker than the heavy 6/4 ones -
This would confirm theory that the Excess phenol in advance of 6/4 Evaporates away.
Phenomenon
These Veneers were all Curled some

176 = This has the most 6/4 of the fine Phenol Series - 7.8 about regular
Veneers are only a little Curled
these are the ones had 2 big beads & blackheads & blisters - They show no signs of ever having received an oven
bent Very Easy on hot plate bends
fine hot bends cold only fair
thin part bends very much cold ok

It is strange that apparently the more 6/4 with Resin & 8% & 6% added the easier it dents hot better it bends hot, Cuts ok - specially bends cold & stays straight better
Outside of beebees 7.8% 6/4 best
Think Sandrac NG or any Resin tends to Contract more than Condensite & Cracks Resin

158 vs NG Brillie

165 - All loose on 325° heat Curled a little - Dents fine -
Extremely flexible but can do anything with it; goes quickly flat
Then will work ok fulcrumfer + Print + will squint & think
Dont bend well Cold Has not anything like the strength of 176-7-8-+9
Cold cuts slightly Choppy
too much Sandrac & quand

172 free + some Curled shows
had previous lifts in 1st Schedule
bad spots also in each one
Didnt test not promising

171 - brillie Cold cuts good not promising -

166 - Blistered no test
look unpromising

173 - Very bad - all blistering
Quad Sandrac Very bad.
Think Sandrac no good
either Bengal pad or not
not sal Ammoniac —
Think proper schedule will do the trick in any Event
1% Bengal the limit ½ preliminary Gallies

161 - Lifts no test
159 - No test lifts -

Note - Think 8¼ or 8½ even 9 6/4
will from at proper schedule give no lifts + ultimately in printing have less Contraction + less tendency to Curl up + Crack - also if Sandrac left out perhaps para also, it will again have less tendency to Curl up on the printed face by being over Condensed -
Should be under condensed in Oven + when furnacy Condensed in press have chance to 6/4 so it will Condense to Limit clear them + give no strains or tendency to Curl -

Doubtful

/ 184EA Coulcmd from old 184

Printed over old Prints –
4 prints – 3 cracked Margin
1 poor print discard

184EA

RO	Fine
1	
2	good
3	
4	
5	
6	
n	

184E

RO	Fine
1	
2	good
3	
4	
5	
6	
none	

More parallel slope RO
& improvement.

184E not dipped 4 Reprint 3 ckd Margin
1 poor print Cancel

RO	Fine
1	
2	good
3	
4	
5	
6	
n	

Mrs Hetler
Union Original
184

185EX Reprint of old seconds
6 printed 2 ok 2 ckd marg 1 pp Dis
1 pprint Cancel

RO	Fine
1	
2	good pp
3	
4	
5	
6	
none	